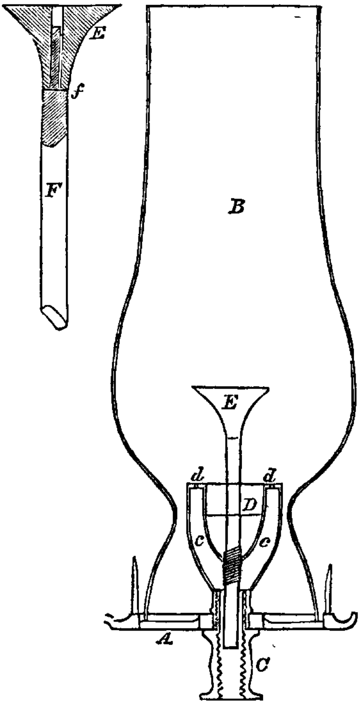
test of the perfect combustion of the gas, the proceeds given off being merely the union of the oxygen of the air with the hydrogen, to form the vapor of water, and with the carbon of the carburetted hydrogen forming carbonic acid. By the side of an Argand, a jet, or a bat's-wing, proceeding from the same double branch, the effect is most striking, and clearly evinces the true philosophical, although simple, principles on which it is constructed. The annexed is a diagram and description of the burner. Fig. 1 is a sectional elevation of burner and glass: A the gallery; B the glass, which gradually swells out from the circular burner in the manner shown, to suit the form of flame; C is the supply-pipe, from which spring two branches, *c, c*, surmounted by the circular burner, D, which has a certain number of orifices round its upper surface, similar to an Argand. The main principle of this invention is the button and stem E, which is screwed into the supply-pipe, as shown in the figure; the button is of brass, and the stem of iron, both solid, and by this application, the gas in rising through the supply-pipe, forms itself into a hollow cylinder, and becomes considerably heated in its passage upwards, and thus rendered more easy of combustion. Fig. 2 is the button and stem shown on a larger scale, F being the stem, and E the button fitting by a small orifice on to the small part of the stem at *f*. The inventors claim for it a saving of from 30 to 40 per cent. over other burners. Ibid.

Fig. 2. Fig. 1.



## *Important Experiments with the Gun Cotton.*

A series of trial experiments, to test the strength of gun-cotton in blasting, as compared with the known powers of gunpowder, took place on Wednesday, in the Standedge tunnel on the Huddersfield and Manchester Railway. A correspondent thus describes the proceedings, and their results: The place selected for the experiments is in the midst of the great Yorkshire chain of hills, between Huddersfield and Manchester, where a tunnel is now constructing through huge masses of millstone grit, and which, when completed, will be the longest tunnel in England. The rocks, which are situate at a depth of 145 yards below the surface of the mountain, consist entirely of close grained quartz—of which some idea may be formed by the fact, that in 110 yards of the tunnel now completed, not one fissure or joint is perceptible. Holes were drilled of 2 in., 1½ in., and 1¼ in. in diameter in the millstone grit, and the charges of gun-cotton varied from 1-6th to 1-3d of the weight of powder ordinarily made use of in blasting. Cartridges containing the gun-cotton were dropped into the holes, with the patent fuse attached—and the quantities varied from 10 ozs. in the larger, to 6 ozs. in the smaller tubes; the quantity of gunpowder employed for similar blast-drills, varying from 1 to 3 lbs. The shots in the tunnel were 12 in number, 10 being charged with gun-cotton, and Nos. 4 and 11 with gunpowder. The shots numbered 2 and 7 in the south heading, and 12 in the north heading, were declared by Mr. Nicholson, the contractor, previous to their being fired, to be those on which the test of the strength of gun-cotton, compared with that of gunpowder, would be most certain, both as to charges and position. No. 2 was charged with 10 ozs. of gun-cotton, and did wonderful execution, exceeding in everything the expectations of both the engineers and miners. No. 7 was charged with 1¼ oz. of gun-cotton, and performed the same work as 6 ozs. of gunpowder. The crowning experiments were Nos. 11 and 12 in the north heading. No. 12 was charged with 16 ozs. of gun-cotton, against 3 lbs. 4 ozs. of gunpowder in No. 11, the shots exceeding anything the engineers or miners had before tested. The gun-cotton exploded first, and threw against the side of the heading, and broke into nine pieces, 220 cubic feet of rock, or about 15 tons weight. This shot, from its connexion with No. 11, was supposed to have assisted it materially. No. 11 removed to the distance of about one yard 224 feet of rock, or about 16½ tons weight, but was broken into six pieces only: thus showing the strength of the one over the other. The following properties were established in these experiments:—That the gun-cotton may be considered of three or four times the strength of gunpowder; that it is entirely free from smoke—a qualification of great importance in mining operations, as the miners can recommence work immediately after the blasts have been fired, which is not the case with gunpowder; that, in keeping the cotton on the works, and its being handled by the men, there is not so much risk from explosion, or loss from waste, as with gunpowder; that it ignites with more certainty than gunpowder; and, from the decreased size of the charge, the depth of the drill-hole may be diminished, and the power more concentrated; it also possesses all the qualities of the best gunpowder, and may be kept under water instead of in a magazine—it does not heat by keeping, and will explode at not less than 350.

Ibid.

## *Another New Planet.*

From the London "Evening Mail" of July 12, 1847.

To the Editor of the Evening Mail.

*Sir:*—Hoping that the weather would have enabled me to accompany it with this night's meridian observations of the new planet,